

PSEUDIONE PARVIRAMUS AND *APOROBOPYRUS*
COLLARDI, TWO NEW SPECIES OF BOPYRIDAE
(ISOPODA: EPICARIDEA) FROM THE
GULF OF MEXICO

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Abstract.—*Pseudione parviramus*, n. sp. is described from the pandalid shrimp, *Parapandalus longicauda* Rathbun. *Aporobopyrus collardi*, n. sp. is described from the porcellanid crab, *Pachycheles rugimanus* A. Milne Edwards. Three bopyrid species are transferred to *Aporobopyrus* from *Pseudione*: *Pseudione lenticeps* Shiino, 1958; *P. orientalis* Shiino, 1933; *P. trilobata* Nierstrasz and Brender à Brandis, 1925. *Pleurocryptosa* Nierstrasz and Brender à Brandis, 1929, is considered a junior synonym of *Aporobopyrus* Nobili, 1906.

A review of the bopyrid literature shows an immense diversity of forms included in *Pseudione* Kossmann, 1881, a large, poorly defined genus that would greatly benefit from a world-wide review. *Aporobopyrus* is one of several Pseudioninae genera that are synonymous with *Pseudione* as historically defined. The distinction of *Aporobopyrus* from *Pseudione* is clarified by an amended generic diagnosis of *Aporobopyrus* and transfer of three species from *Pseudione* to *Aporobopyrus*.

Pseudione parviramus, new species
Figs. 1, 2

Material examined.—Investing *Parapandalus longicauda* Rathbun, 1902. Northern Gulf of Mexico, Oregon II sta 14003; 28°44'N, 89°38'W, trawl, 133 m, 29 Nov 1973, D. L. Adkison coll., M. R. Dardeau det. host, 1 ♀ (gravid), 1 ♂ USNM 172443.—Sta BLM I-C-c-7, 26°26'N, 84°19'W, trawl, 200 m, 28 Jan 1976, T. S. Hopkins coll., M. R. Dardeau det. host, 1 ♀ (gravid, holotype) USNM 172441, 1 ♂ USNM 172442.

Description.—Female (Figs. 1, 2a, b): Length 9.0 to 11.0 mm; width across pereomere 3, 6.0 mm; distortion 18 to 22°.

Head: Eyes present. Frontal lamina long-

er laterally than medially. First antenna of 3 articles. Second antenna of 6 articles. Maxilliped subquadrate; palp articulated, setose and medially directed. Posterior lamina with 2 pairs of lanceolate projections.

Pereon broadest across pereomere 3. Coxal plates prominent on pereomeres 1-4, larger on expanded side. Dorsolateral bosses present on pereomeres 1-4, larger on concave side. Tergal area not greatly developed; lateral plates on pereomeres 5-7 arising from coxal area, lateral plates larger on expanded side. Oostegite 1 with posterolateral point blunt and internal ridge ornamented laterally with low rounded projections. Pereopods without carinae.

Pleon of 6 segments; lateral plates on pleomeres 1-5, decreasing in length posteriorly. Pleopods, 5 biramous pairs; each exopod larger than endopod; exopods of anterior pleopods longer than lateral plates, posterior exopods and lateral plates nearly equal; endopods of pleopods 1 and 2 ovate; posteriorly, endopods becoming progressively longer. Uniramous uropods similar in shape to and smaller than exopod of pleopod 5.

Male (Fig. 2c-h): Length 3.7 mm; width across pereomere 3, 1.2 mm.

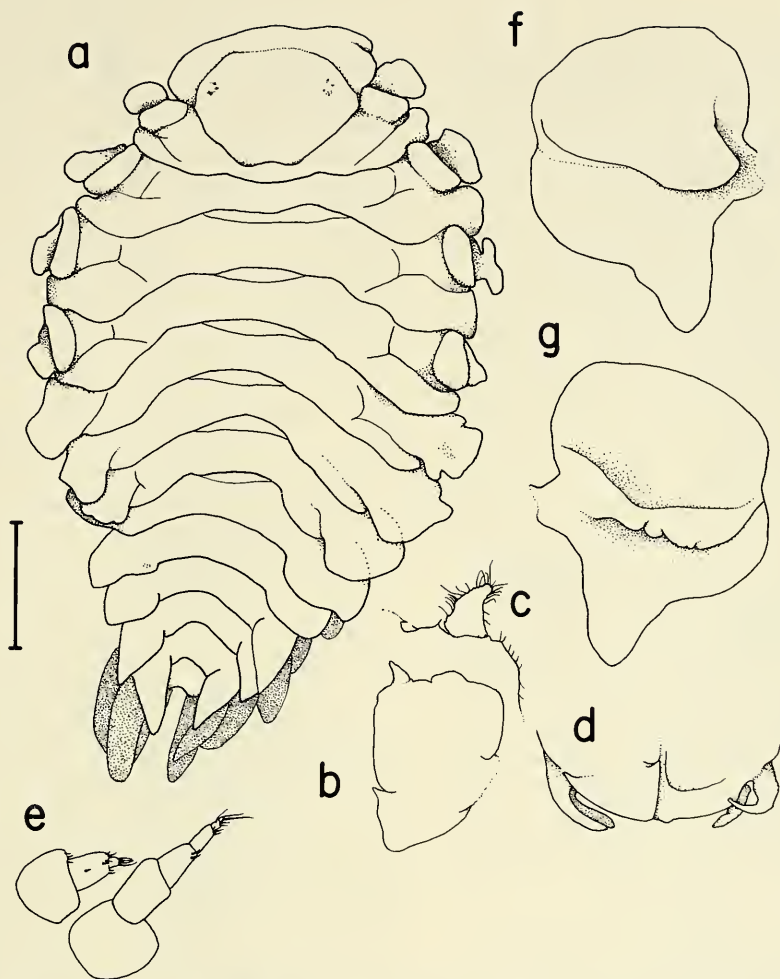


Fig. 1. *Pseudione parviramus*, female holotype: a, Dorsal view; b, Maxilliped, external view; c, Palp, internal view; d, Posterior lamina, right maxilliped present; e, Antennae; f, Oostegite 1, external view; g, Same, internal view. Scale = 2.0 mm (Fig. a).

Head trapezoidal, eyes present. First antenna of 3 articles. Second antenna of 7 articles. Maxillipeds present.

Pereon with pereopods of similar size, dactyls of pereopods 1 and 2 longer than others. Midventral tubercles on pereomeres 6 and 7.

Pleon of 6 pereomeres; 5 pairs of uniramous pleopods, smaller posteriorly, not visible in lateral view. Midventral tubercles on pleomeres 1 and 2. Pleomere 6 broadly Y-shaped, anal cone indistinct.

Etymology.—The specific name alludes

to the short pleopodal endopods of the female.

Distribution.—*Pseudione parviramus* is only known from the type series from the coastal waters of the Gulf of Mexico.

Discussion.—*Pseudione parviramus* is similar to *P. affinis* (Sars, 1882) and *P. tattersalli* Nierstrasz & Brender à Brandis, 1923. All three species infest pandalid shrimps: *P. affinis* on *Dichelopandalus bonnierii* (Kinahan), *Pandalus montagui* Leach, *Plesionika antiquai* Zariquiey Alvarez, *P. heterocarpus* (Costa) and *P. martia* (Milne

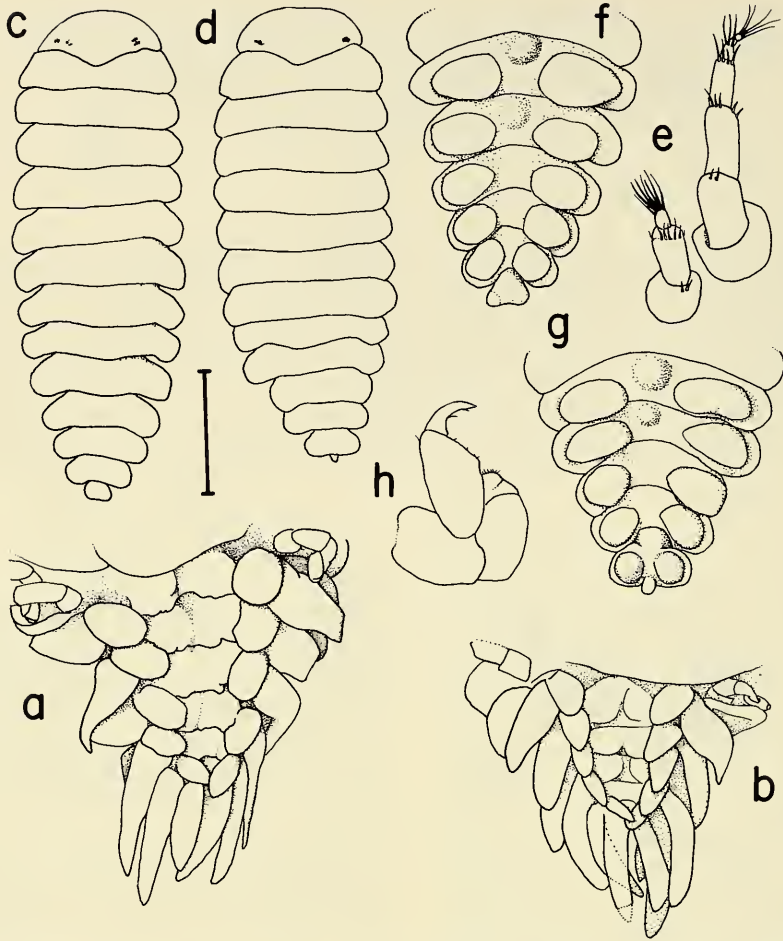


Fig. 2. *Pseudione parviramus*, a, b female; c–h male: a, Pleon of holotype, ventral view; b, Pleon of paratype, ventral view; c, d, Dorsal view; e, Antennae; f, g, Pleon, ventral view; h, Pereopod 1. Figure c, f from USNM 172443. Figure d, e, g, h from USNM 172442. Scale = 1.0 mm (Fig. c, d).

Edwards) as reported by Bourdon (1968); *Pseudione tattersalli* on *Plesionika ensis* (Milne Edwards) as reported by Bourdon (1972); and *Pseudione parviramus* on *Parapandalus longicauda*.

Pseudione parviramus females differ from females of *P. affinis* and *P. tattersalli* by enlarged lateral areas of pereomeres 5–7 and shorter endopods of anterior pleopods. Both *P. tattersalli* and *P. parviramus* have articulated maxilliped palps, while *P. affinis* has a non-articulated maxilliped palp. Males of *P. parviramus* have eyes and reduced pleopods not visible in lateral view of the pleon.

The only abnormality noted was that the sixth pleomere of one male apparently failed to develop normally and is indicated by the small projection posterior to fifth pereomere.

Aporobopyrus Nobili, 1906

Diagnosis.—Female: Body only slightly distorted, all regions and segments distinct. Head large; anterior lamina narrow medially, laterally developed into distinct lobes with acute points; maxilliped with palp reduced, palp location indicated; posterior

ventral lamina with 2 pairs of reduced projections. Pereon with small coxal plates on pereomeres 1–4; small dorsolateral bosses on pereomeres 1–4; lateral plates reduced. Pleon with lateral plates reduced or absent; 5 pairs of biramous pleopods, near lateral margins of pleomeres, visible in dorsal view; uropods uniramous.

Male: All segments distinct. Pleon of 6 pleomeres, decreasing in width posteriorly; pleopods reduced or absent; uropods absent.

Type-species.—*Aporobopyrus aduliticus* Nobili, 1906.

Discussion.—As diagnosed above, the females of *Aporobopyrus* differ from those of *Pseudione* thus: dorsolateral bosses are small, pleon lateral plates are reduced or absent, and pleopods are visible in dorsal view. The head of the female *Aporobopyrus* is also relatively large and its posterior ventral lamina projections small.

In light of the amended diagnosis of *Aporobopyrus*, four species previously assigned to *Pseudione* are here reassigned to *Aporobopyrus*: *Pseudione lenticeps* Shiino, 1958; *P. petrolistheae* Shiino, 1933; *P. orientalis* Shiino, 1933; and *P. trilobotata* Nierstrasz & Brender à Brandis, 1925. *Aporobopyrus lenticeps* (Shiino, 1958) is known from Japan on *Munida japonica heteracantha* Ortmann; *A. petrolistheae* (Shiino, 1933) is known from Japan on *Petrolisthes japonicus* (de Haan) and from Amboine on *P. militaris* (Heller) as *A. petrolistheae palpifera* (Bourdon, 1976); *A. orientalis* (Shiino, 1933) is known from Japan on *Galathea orientalis* Stimpson; and *A. trilobotata* (Nierstrasz & Brender à Brandis, 1925) is known from Curaçao on *Neopisoma angustifrons* (Benedict) and from the Pacific coast of Mexico on *Petrolisthes hians* Nobili. With the transference of these species, *Aporobopyrus* differs from *Pseudione* in the development of the anterior lamina into long lateral projections as pointed out by Markham (1975).

With the improved diagnosis of *Aporobopyrus* and more distinct separation from

Pseudione, it became apparent that *Pleurocryptosa* Nierstrasz & Brender à Brandis, 1929, falls within the diagnosis of *Aporobopyrus*. The development of the frontal lamina of the female distinguishes *Aporobopyrus* and *Pleurocryptosa* but is too variable (Bourdon 1976, 1983). Therefore, *Pleurocryptosa* is considered a junior synonym of *Aporobopyrus* and its five species: *P. calypso* Bourdon, 1976; *P. enosteoides* Markham, 1982; *P. megacephalon* Nierstrasz & Brender à Brandis, 1929; *P. parvula* Bourdon, 1983; and *P. pleopodata* Bourdon, 1983, are here assigned to *Aporobopyrus* accordingly. *Aporobopyrus calypso* (Bourdon, 1976) is known from Brazil on *Pachycheles ackleianus* (A. Milne Edwards); *P. enosteoides* (Markham, 1982) is known from Hong Kong on *Enosteoides ornatus* (Stimpson); *P. megacephalon* (Nierstrasz & Brender à Brandis, 1929) is known from Thailand on an undetermined porcellanid crab; *P. parvula* (Bourdon, 1983) n. comb. is known from Seram Island on *Lissoporellana spinuligera* (Dana); and *P. pleopodata* (Bourdon, 1983) is known from Mar-segu Island on *Polyonyx obesulus* Miers.

Aporobopyrus collardi, new species

Figs. 3–5

Material examined.—Infesting *Pachycheles rugimanus* A. Milne Edwards, 1880, coll. by T. S. Hopkins, except as noted; all hosts det. by D. L. Adkison. Eastern Gulf of Mexico: sta MAFLA III-E(39), 29°45'N, 86°00'W, Capetown dredge, 45 m, 5 Jun 1974, 1 ♀, 1 ♂ USNM 173443.—Sta MAFLA II-D(246), 28°38'06"N, 84°19'06"W, diver collected, 41 m, 11 Jun 1974, 1 ♀ (gravid), 1 ♂ ZMC.—Sta MAFLA III-G(141), 30°01'03"N, 85°54'54"W, diver collected, 30 m, 6 Jun 1974, 2 ♀ (gravid), 2 ♂ MNHN Ep. 110 and 111 (host present).—Sta MAFLA III-F(41), 29°47'30"N, 85°54'30"W, diver collected, 41 m, 11 Jun 1974, 3 ♀ (gravid), 3 ♂ RMNHL I-5910.—Sta BLM 13 V-A-2, 29°55'N, 86°06'W, Capetown

dredge, 20 Jul 1975, 2 ♀ (gravid), 2 ♂ USNM 173444.—Sta BLM 19-151; 28°32'15"N, 84°18'45"W, diver collected, 28–38 m, 27 Oct to 2 Nov 1975, 1 ♀ (gravid), 1 ♂ USNM 173450.—Sta 33 I-A-a-3, 26°24'N, 82°58'W, Capetown dredge, 37 m, 29 Feb 1976, 1 ♀, 1 ♂ USNM 173445.—Sta BLM 37 247, 28°36'16"N, 84°15'51"W, diver collected, 28–38 m, 3 Jun 1976, 1 ♀, 1 ♂ USNM 173446.—Sta BLM 37 151, 28°32'15"N, 84°18'45"W, diver collected, 28–38 m, 7 Jul 1976, 1 ♀ (gravid), 1 ♂ USNM 173447.—Sta 2315-401870830, 28°58'N, 85°23'W, trawl, 38 m, 30 Jul 1977, 1 ♀ (gravid), 1 ♂ MNHN Ep. 85.—Sta 2426-181870901, 28°58'N, 85°23'W, Capetown dredge, 82 m, 1 Oct 1977, 1 ♀, 1 ♂ USNM 173448.—Sta 2103-191871023, 26°24'N, 82°58'W, Capetown dredge, 38 m, 23 Oct 1977, 1 ♀, 1 ♂ USNM 173449.—Sta 2103-171880201, 26°24'N, 82°58'W, trawl, 37 m, 1 Feb 1978, 1 ♀ (gravid, holotype) USNM 173441, 1 ♂ USNM 173442.

Description.—Female (Figs. 3, 4): Length 1.5 to 3.6 mm; width across pereomere 3, 1.6 to 2.4 mm; distortion 10 to 35°.

Head, large, length and width approximately equal; anterior lamina distinct, medially narrow, broadening into lobes laterally. Eyes present, often visible only in ventral view. First antenna of 3 articles. Second antenna of 5 articles, basal segment enlarged. Second antenna nearly twice as long as length of first antenna. Maxilliped with distinct non-articulated palp to sharp anteromedial corner lacking palp. Posterior lamina with 2 pairs of small projections, lateral pair often with lateral tubercle; medial pair of projections with 1–3 tubercles.

Pereon with coxal plates on pereomeres 1–4, larger on expanded side and posteriorly; on expanded side, pereomere 5 rarely with coxal plate distinct. Dorsal bosses on pereomeres 1–4; on expanded side, tergal area reduced. Pereopods longer posteriorly; on expanded side, pereopods 3–7 with basal carinae, carinae larger posteriorly; on re-

duced side, pereopods without carinae. First oostegite with short posterolateral projection and internal ridge ornamented with few small tubercles laterally.

Pleon with short lateral plates, those on expanded side larger, all shorter posteriorly. Five pairs of biramous pleopods; rami of pleopods 1–2 oval, others elongate; all pleopods with endopods larger than exopods. Uniramous uropods, length often unequal.

Male (Fig. 5): Length 1.5 to 2.4 mm; width across pereomere 4, 0.5 to 0.8 mm.

Head broadly rounded anteriorly. First antenna of 3 articles. Second antenna of 5 articles. Second antenna less than twice length of first antenna. Maxillipeds present.

Pereon widest across pereomere 4, tapering both anteriorly and posteriorly; pigment spots dorsally on some pereomeres. Midventral tubercles absent. Pereopod 1 larger than others.

Pleon of 6 pleomeres, narrower posteriorly. Pleopods absent, indicated only by shallow depressions. Pleomere 6 with posterior margin produced into 2 lateral lobes and central anal cone.

Etymology.—This species is named for Dr. Sneed B. Collard, who started me on the study of the Epicaridea.

Distribution.—*Aporobopyrus collardi* is only known from the type series collected in the eastern Gulf of Mexico.

Discussion.—*Aporobopyrus collardi* is most similar to *A. trilobata* and *A. calypso*. The female of *A. collardi* differs from *A. trilobata* thus: its second antenna has five articles, coxal plates are larger on expanded side, dorsal bosses on reduced side are not bilobed, and endopod of pleopod 1 is folded onto itself. The female of *A. collardi* differs from *A. calypso* thus: its first oostegite has a tuberculate internal ridge, coxal plates are larger, lateral area of pereomeres 5–7 has a defined tergal area, first pleomere on expanded side has larger lateral plate and endopod of first pleopod is not greatly larger than exopod. The male of *Aporobopyrus col-*

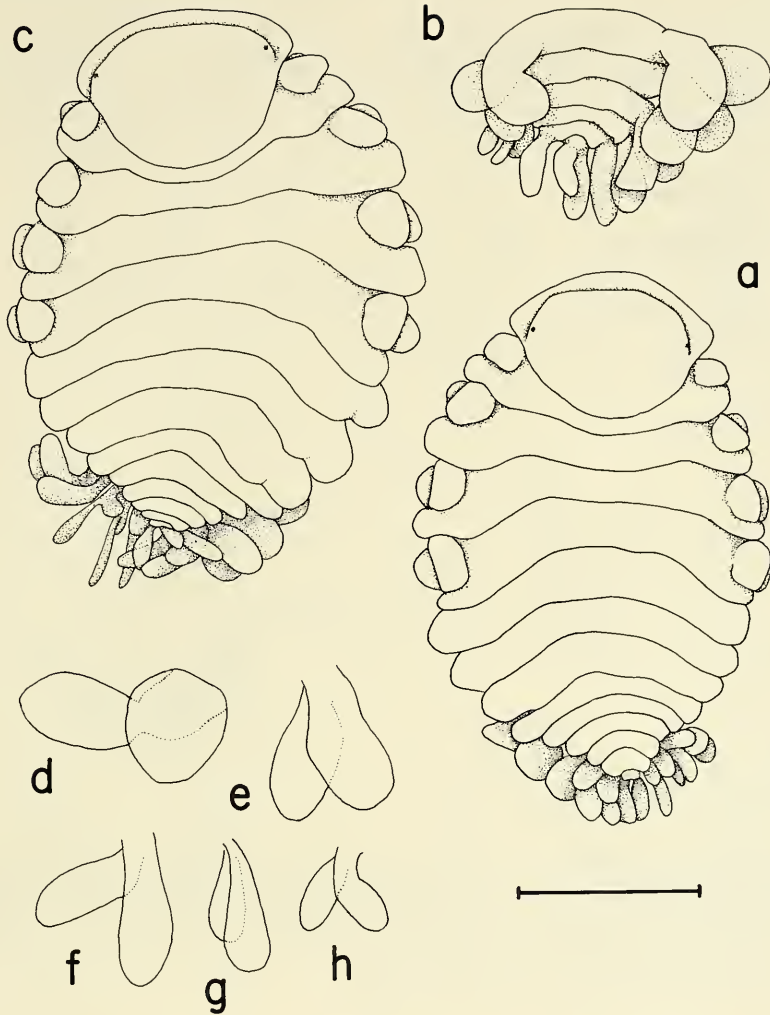


Fig. 3. *Aporobopyrus collardi*, female: a, Dorsal view; b, Pleon, ventral view of a; c, Dorsal view; d-h, Pleopods from expanded side; d, Pleopod 1; e, Pleopod 2; f, Pleopod 3; g, Pleopod 4; h, Pleopod 5. Figure c-h from USNM 173444. Scale = 1.0 mm (Fig. a, b).

lardi lacks pleopods and therefore differs from the males of both other species. The pleopods of male *A. collardi* are indicated by oval concave areas visible only after staining.

Aporobopyrus collardi is the second species of *Aporobopyrus* reported from the western North Atlantic and differs from *A. curtatus* (Richardson) for the female thus: first antenna of 5 articles; posterior ventral lamina

of head with 2 pair of projections; on expanded side, pereopods 3-7 with basal carinae; pleopods non-tuberculate; and for the male pleopods are absent.

Differences in the relative size of the rami of the posterior pleopods for female *A. collardi* were seen. Less mature females differ from mature females by a much larger endopod relative to the exopod for immature females. The lack of a full maturation series

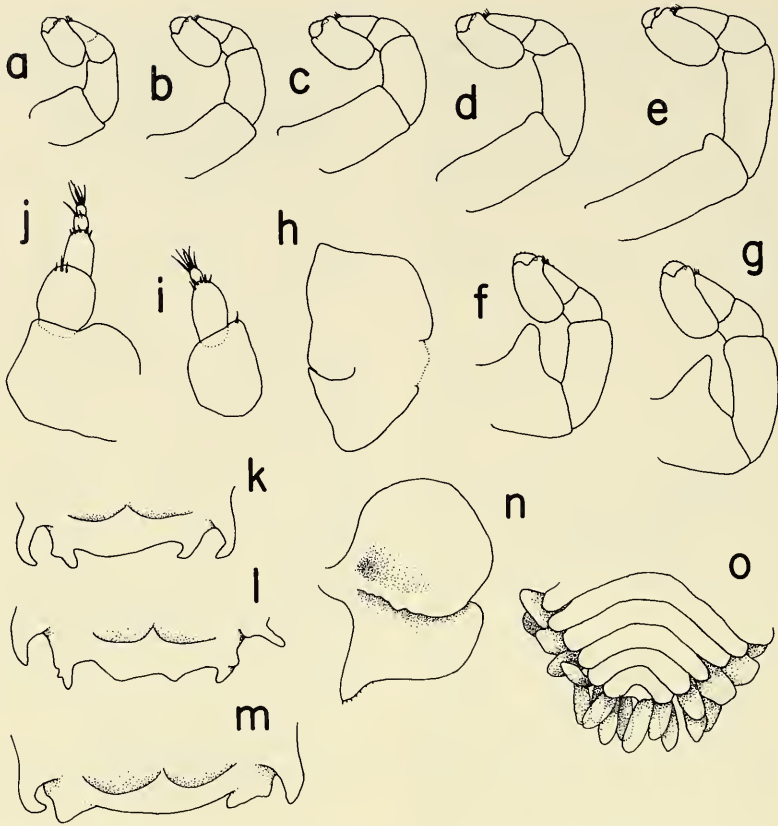


Fig. 4. *Aporobopyrus collardi*, female: a-e, pereopods, reduced side; a, Pereopod 1; b, Pereopod 4; c, Pereopod 5; d, Pereopod 6; e, Pereopod 7; f-g, Pereopods, expanded side; f, Pereopod 6; g, Pereopod 7; h, Maxilliped; i, Antenna 1; j, Antenna 2; k-m, Posterior lamina; n, Oostegite 1, internal view; o, Pleon, dorsal view. Figure a-k, o from USNM 173444. Figure l, m from RMNHL I-5910. Figure n from holotype. Scale = 1.0 mm (Fig. a, b).

precludes definitive demonstration of proportional changes in the pleopodal rami proportions with maturation.

Two male forms were found differing in the degree of separation of the pereomeres. The forms differed in no other characteristics noted.

Two abnormal male specimens of *A. collardi* were found. One specimen appeared damaged and had only four pleomeres. The fourth pleomere was wider than normal and had an irregular posteromedial margin with two small projections, possibly indicating pleomeres 5-6 had been removed in the past.

The other specimen had six pleomeres on the left side but only five pleomeres on the right side with pleomeres 3-4 fused.

Of the 14 female specimens that were with their hosts, seven were in the right branchial chamber (4 ♀ host, 3 ♂ host) and seven in the left (3 ♀ host, 4 ♂ host). Three female hosts were gravid. Unlike their effects on most host families, bopyrids often do not castrate female porcellanids. Gravid host are common though onset of reproduction is delayed and the number of eggs carried is reduced (see Van Wyk 1982 for discussion).

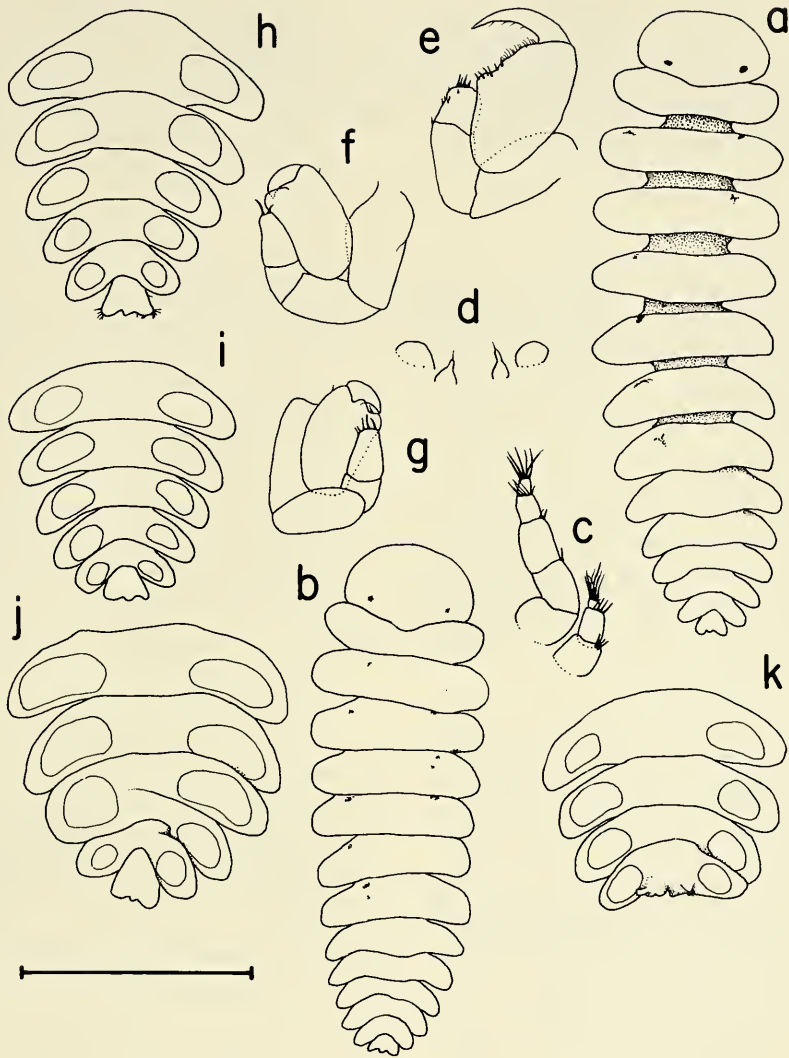


Fig. 5. *Aporobopyrus collardi*, male: a, Dorsal view, chain form; b, Dorsal view, compact form; c, Antennae; d, Maxillipeds; e, Pereopod 1; f, Pereopod 7, anterior view; g, Pereopod 7, posterior view; h-k, Pleon ventral view. Figure a, h, k from RMNHL I-5910. Figure b, d, i from ZMC. Figure c, e-g from USNM 173444. Figure j from USNM 173450. Scale = 1.0 mm (Fig. a, b).

Acknowledgments

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contracts to him. I thank Dr. Thomas E. Bowman for allowing me to examine bopyrid material at the Smithsonian Institution. I thank Dr. Roland Bourdon for comments on the distinction of *Pleurocryptosa* from *Aporobopyrus* and comparison of *A. collardi* with other *Aporobopyrus* species. Types are deposited in the collections of the

Smithsonian Institution, Washington, D.C. (USNM); Universitetets Zoologiske Museum, Copenhagen (ZMC); Rijksmuseum van Natuurlijke Historie, Leiden (RMNHL); and Muséum National d'Histoire Naturelle, Paris (MNHN).

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